

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference P 43317 WO	FOR FURTHER ACTION		See item 4 below
International application No. PCT/EP2004/007753	International filing date (<i>day/month/year</i>) 14 July 2004 (14.07.2004)	Priority date (<i>day/month/year</i>) 09 September 2003 (09.09.2003)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant CARL ZEISS SMT AG			

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Date of issuance of this report 10 July 2006 (10.07.2006) Authorized officer <p style="text-align: center; font-weight: bold;">Agnes Wittmann-Regis</p> e-mail: pt06@wipo.int
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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

PCT

Translation

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference P 43317 WO		Date of mailing (day/month/year) See form PCT/ISA/210
International application No. PCT/EP2004/007753		FOR FURTHER ACTION See paragraph 2 below
International filing date (day/month/year) 14.07.2004	Priority date (day/month/year) 09.07.2003	
International Patent Classification (IPC) or both national classification and IPC G03F7/20		
Applicant CARL ZEISS SMT AG		

1. This opinion contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the opinion
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP	Authorized officer
Facsimile No.	Telephone No.

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Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language
_____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	4, 23, 31	YES
	Claims	1-3, 5-22, 24-30	NO
Inventive step (IS)	Claims	4, 23, 31	YES
	Claims	1-3, 5-22, 24-30	NO
Industrial applicability (IA)	Claims	1-31	YES
	Claims		NO
2. Citations and explanations:			
<p>1 Reference is made to the following documents:</p> <p>D1: DE 100 02 626 A1 (CARL ZEISS) 26 July 2001 (2001-07-26)</p> <p>D2: EP-A-1 061 396 (CANON KABUSHIKI KAISHA) 20 December 2000 (2000-12-20)</p> <p>D3: EP-A-1 174 749 (SVG LITHOGRAPHY SYSTEMS, INC) 23 January 2002 (2002-01-23)</p> <p>D4: US 2003/002172 A1 (OHTAKE MOTOYUKI ET AL) 2 January 2003 (2003-01-02)</p> <p>D5: US 2002/039175 A1 (SHAFFER DAVID R ET AL) 4 April 2002 (2002-04-04)</p> <p>2 Independent Claim 1</p> <p>The present application does not appear to meet the requirements of PCT Article 33(1) since the subject matter of claim 1 is not novel within the meaning of PCT Article 33(2).</p> <p>Document D1 discloses all the features of claim 1 (see figure 5, table 2, and also the passages cited in the</p>			

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citations and explanations supporting such statement

search report):

Optical imaging system (figure 5) for a microlithography projection exposure apparatus for imaging an object field arranged in an object plane (OB') of the imaging system into an image field arranged in an image plane (IM') of the imaging system, comprising:

a multiplicity of lenses (102-182) which are arranged between the object plane and the image plane and each have a first lens surface and a second lens surface, at least one of the lenses being a double aspherical lens in which the first lens surface (172) and the second lens surface (173) are an aspherical surface.

It is explicitly mentioned in D1 (page 8, lines 52-55) that the two aspherical surfaces (172, 173) could also form the front and rear sides of an individual lens.

Therefore, claim 1 is not novel.

The corresponding observation applies *mutatis mutandis* to **claim 28**.

3 Dependent claims 2,3,5-20

These dependent claims are not novel and therefore do not meet the requirements of PCT Article 33(2):

- Optical imaging system according to **claim 2**; cf. D1, page 4, line 62
- Optical imaging system according to **claim 3**; cf. D2, figure 10, Table page 49 (ASP9, ASP10) since the

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Box No. V

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surface curvatures and the aspherical constants essentially match.

- Optical imaging system according to **claim 5**: the two aspherical lens surfaces (172, 173) are symmetrical (cf. page 4, line 62). According to the present application (description, page 26, lines 22-23), symmetrical lens surfaces can be tested by means of the same test optical arrangement and are thus similar.
- Optical imaging system according to **claim 6**; cf. D1, figure 5, field plane AS2'
- Optical imaging system according to **claim 7**; cf. D1, page 7, line 59
- Optical imaging system according to **claim 8**; cf. D1, page 5, lines 36-43
- Optical imaging system according to **claim 9**; cf. D2, figure 10, Table page 49 (ASP29, ASP30)
- Optical imaging system according to **claim 10**; cf. D2, figure 13, Table page 50 (biconvex lens ASP21, ASP22)
- Optical imaging system according to **claims 11, 20**; cf. D2, figure 13, Table page 50 (meniscus lens ASP7, ASP8)
- Optical imaging system according to **claim 12**; cf.

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D1, page 9, lines 3-17

- Optical imaging system according to **claims 13, 14**;
cf. D2, figure 10, Table page 49
- Optical imaging system according to **claim 15**; cf.
D1, figure 1
- Optical imaging system according to **claim 16**; cf.
D1, figure 5, because the double asphere (172, 173)
may also form the front and rear sides of an
individual lens (cf. page 8, line 52) and lies "in
the vicinity" of the intermediate image IM'. The
expression "in the vicinity" is not specified, so
that it also encompasses the position of the double
asphere (172, 173) relative to the intermediate
image IM'.
- Optical imaging system according to **claims 17, 18**;
cf. D2, figure 46, Table page 61 (lens ASP1, ASP2)
- Optical imaging system according to **claim 19**; cf.
D2, paragraph [0426], figure 46: lens G2

4 Claims 21, 24, 25-27, 29, 30

These claims are not novel and therefore do not meet the
requirements of PCT Article 33(2):

Claims 21, 24 are not novel: the same observation as for
claim 5 is applicable.

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Claims 25-27 are likewise not novel: the aspherical surfaces (27, 33) are formed on different lenses and are symmetrical (D1, page 7, line 5). A further optical surface (M1, M2) is situated between these two surfaces.

Claims 29, 30 are implicitly disclosed in D1 and are therefore not novel: D1 discloses an imaging system comprising aspherical lens surfaces which can be tested by means of the same test optical arrangement (cf. observation regarding claims 3 and 5). The method steps for the production of such an imaging system are implicitly contained in D1.

5 Further objections could be made by means of **D3-D5** (see the search report).